

# Representing and predicting positive outcomes

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This presentation was presented at the International Conference on Pluralistic Counselling and Psychotherapy (ICPCP) 2020

Smith, K. (2020) '*Representing and predicting positive outcomes*', 1st International Conference on Pluralistic Counselling and Psychotherapy, United Kingdom, 19 July 2020.

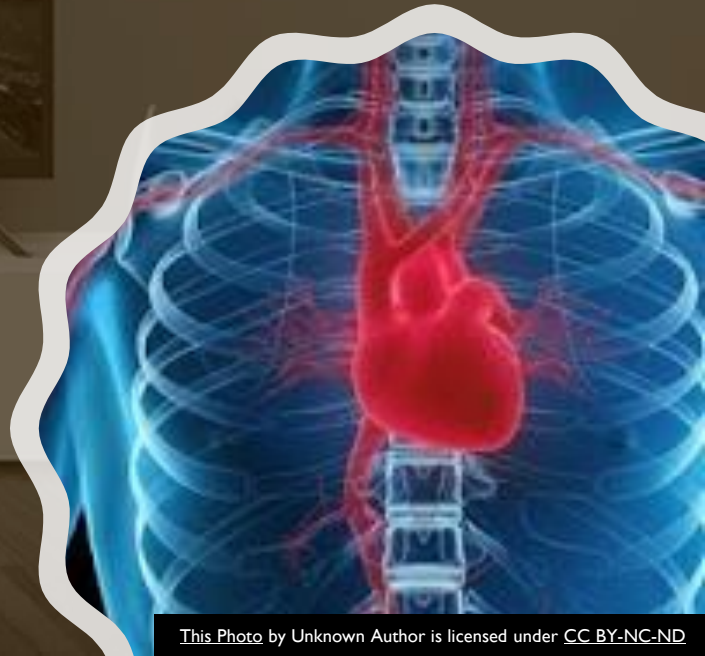
# **REPRESENTING AND PREDICTING POSITIVE OUTCOMES**

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**@KATESMITHTCC**

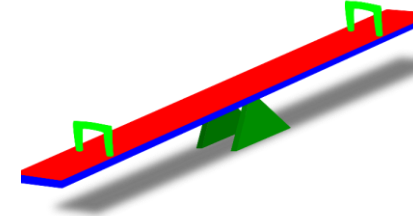
# A BIT OF BACKGROUND

- Self-confirmatory bias
- Correlation does not imply cause
- Why are we even doing research???



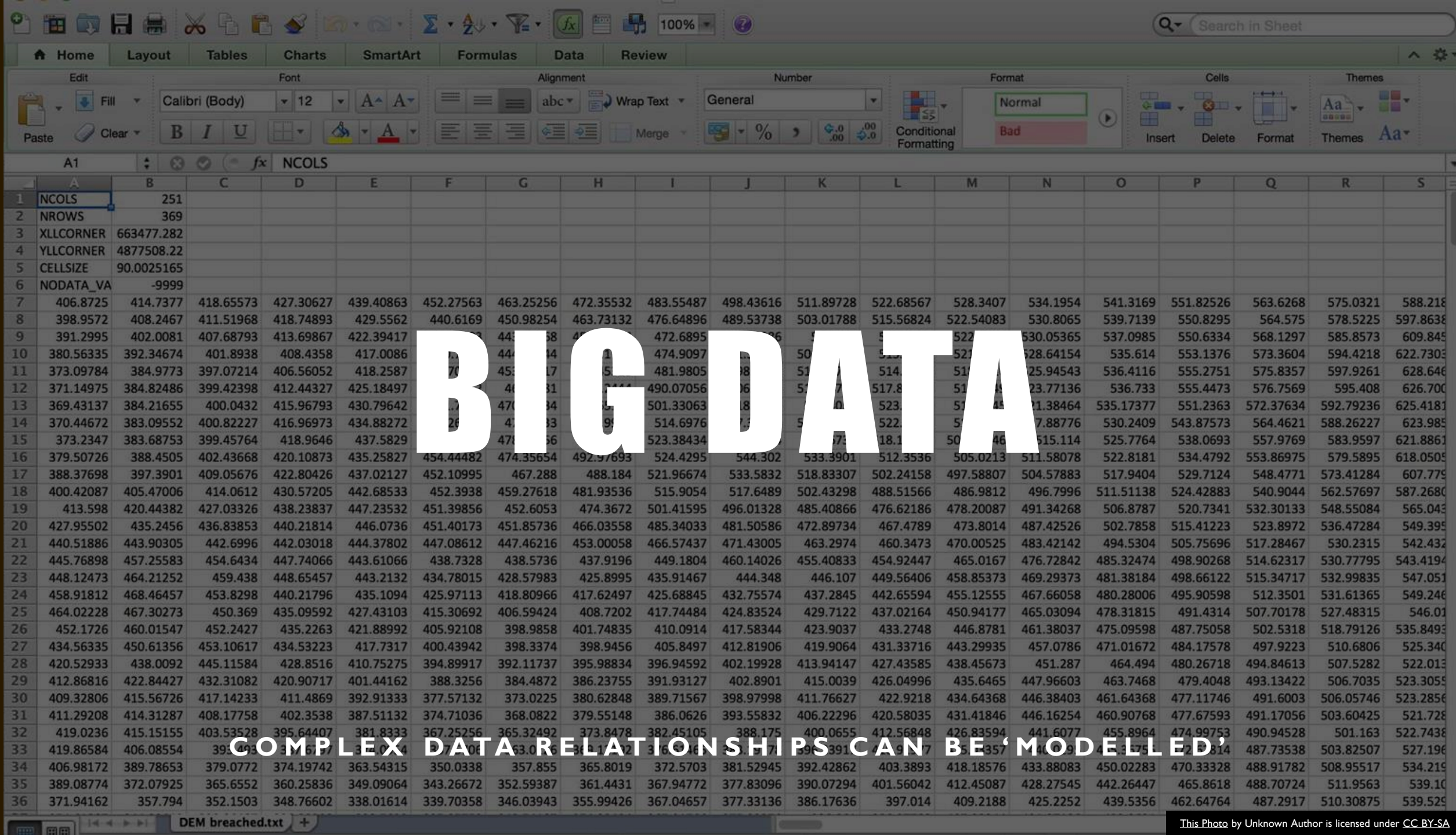
# STATISTICS AND MODELLING FOR BEGINNERS (APOLOGIES)

- “What are my chances doc?”
- Patterns in the data
- Cause and effect relationships
- Underlying effects – not clear to the ‘naked eye’



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BIG DATA

COMPLEX DATA RELATIONSHIPS CAN BE 'MODELLED'

# TAYSIDE CENTRE FOR COUNSELLING

- Community clinic
- Part of the Research and Training Clinic Consortium
- Research clients and counsellors
- Mainly pluralistic (varied levels of adherence to the model...see Marie-Clare's research for more)



# TAYSIDE CENTRE FOR COUNSELLING

- Data corpus:
  - Session rating scales e.g. HAT
  - Mood scales
    - Depression - Patient Health Questionnaire, PHQ-9: (Kroenke et al., 2001)
    - Anxiety Generalized Anxiety Disorder scale, GAD-7: (Spitzer et al., 2006)
    - Clinical Outcomes in Routine Evaluation, CORE: (Evans et al., 2006)
  - Client assessment and evaluations
  - Spoken word, conversation





# WHAT DID WE FIND?

- 'Outcomes' data:
  - Session rating scale (HAT - helpful, progress, meritorious)
  - CORE-34, PHQ9, GAD7
- Yup – counselling helps with psychological distress on all measures
- First four weeks ratings for session improves
- Counsellors and clients evaluations of HAT correlated BUT FOR DIFFERENT REASONS
  - Counsellors ratings were only reliably predicted by CORE score (secondary measure)
  - Client ratings appear to be for other reasons (probably how good they found it)





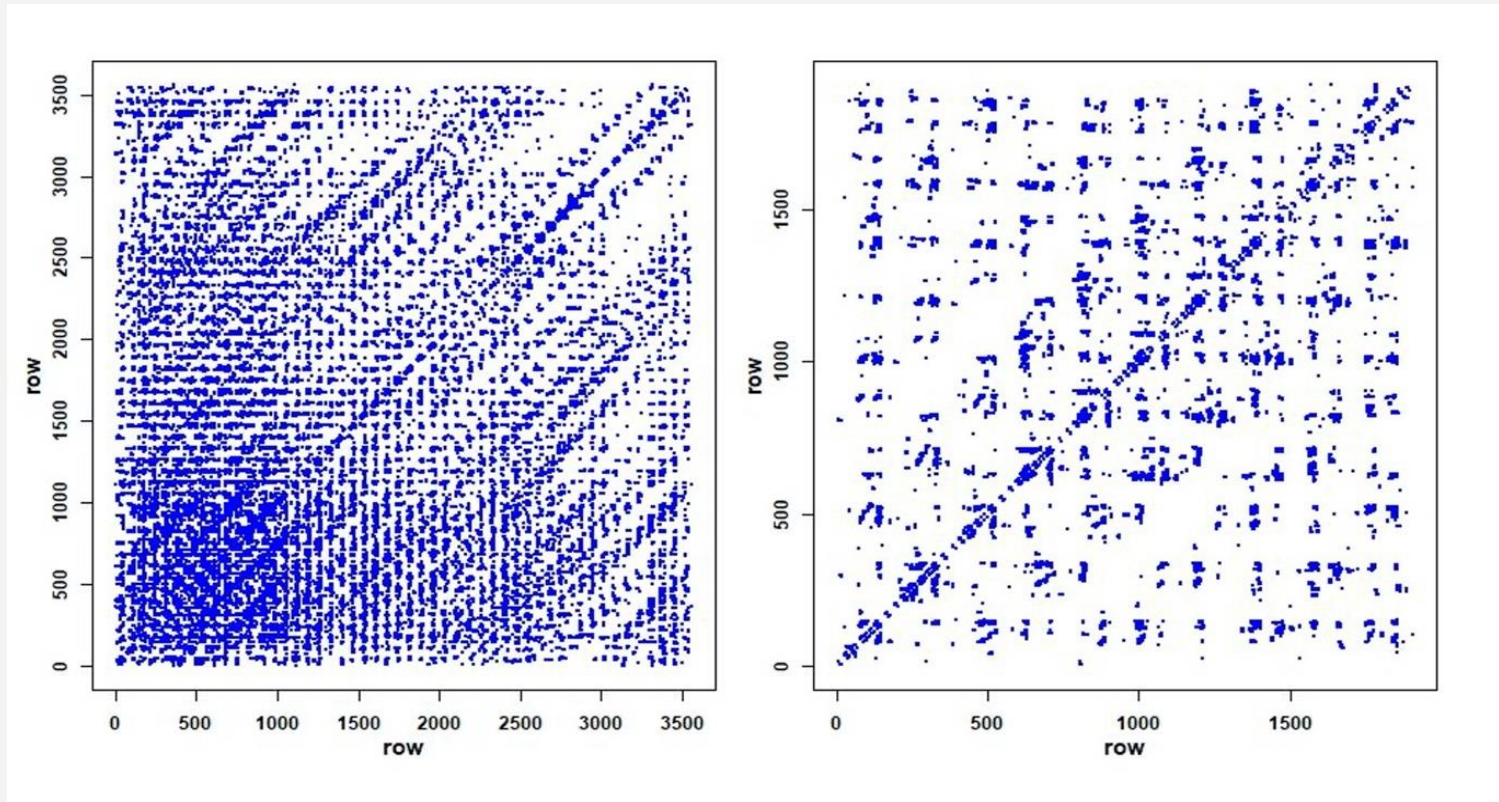
# BIG DATA CRUNCH

- Corpus – audio of 235 sessions
- 30 clients (aged 21 to 65 years; 21 women, 9 men) who interacted with 12 therapists (11 women, 1 man)
- **Analysis:**
- Mixed effect modelling of recurrence sequences
  - An alignment measure
  - speech rate and pitch as non-verbal parameters
  - HAT outcomes

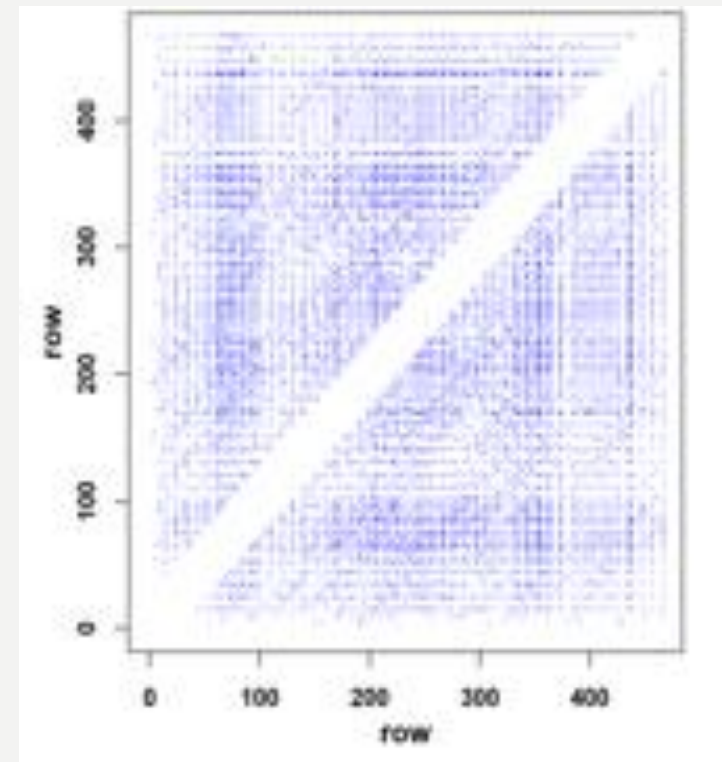
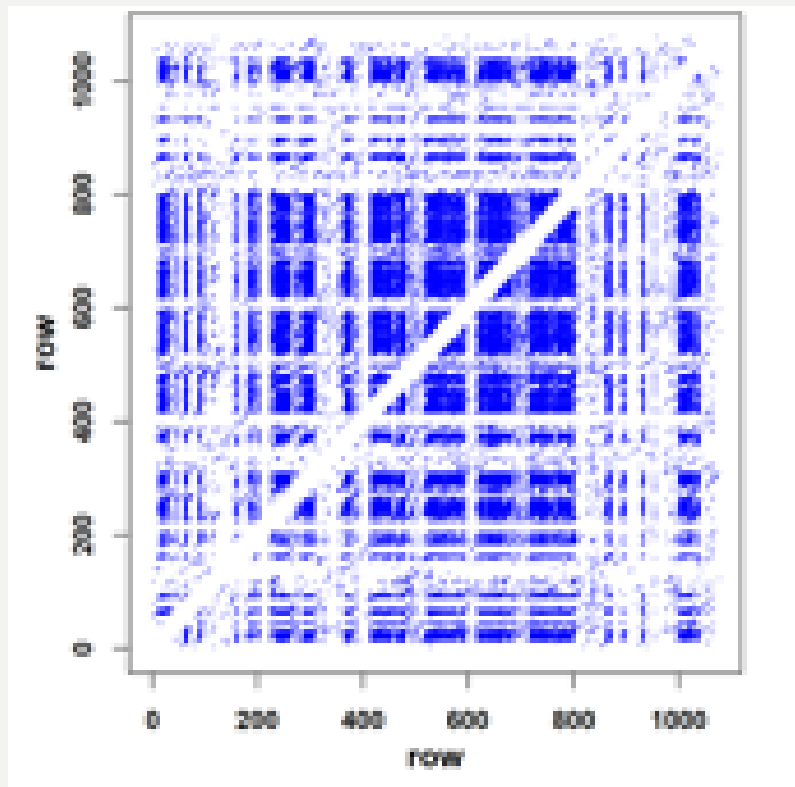


# RECURRENCE PLOTS (FOOTPRINTS)

LEFT – SPEECH RATE  
RIGHT – PITCH



# HIGHLY EFFECTIVE SESSION (LEFT)



# WHAT DOES THIS ALL MEAN

- Recurrence quantification analysis (RQA) quantifies synergy independent of content of communication
  - Effectiveness of the therapy session (conversation) may depend on the how well the dyad coordinate their communication style
1. Counselling helps...
  2. Therapists aren't using the information they should to judge how the session went..
  3. Clients may feel better about the session when they speak to someone in synchrony

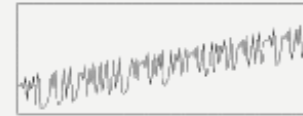
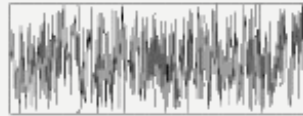


# THANKS FOR LISTENING

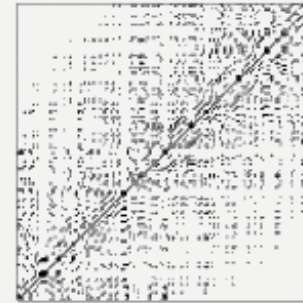
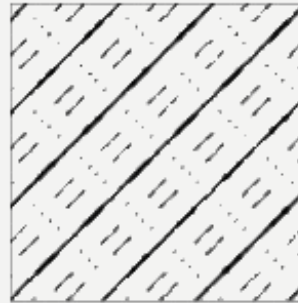


# TYPOLGY OF RECURRENCE PLOTS

Time series:



Recurrence plot:



Underlying system:

homogeneous /  
white noise

harmonic  
oscillations

chaotic data with  
linear trend

auto-regressive  
process

Examples for purposes of illustration taken from Wikipedia!

